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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/024,699 | 12/21/2001 | Satoshi Seo | 12732-088001 | 6811 |

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EXAMINER

HODGES, MATTHEW P

ART UNIT PAPER NUMBER

2879

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/024,699

Applicant(s)

SEO ET AL.

Examiner

Matt P. Hodges

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-12, 21-28, 31-34, 39, 40, 43-46 and 51-104 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-12, 21-28, 31-34, 39, 40, 43-46 and 51-104 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/2/2005 has been entered.

The Amendment, filed on 5/02/2005, has been entered and acknowledged by the Examiner.

Cancellation of claims 13-20, 35-38, and 47-50 has been entered.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Specifically the title should distinguish itself from other applications in the same subclass. One example might be to include "with mixed layers" or something similarly drawn to the claimed subject matter.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 21, 23, 25-28, 39, 40, 51-60, 81-88, and 97-104 are rejected under 35

U.S.C. 102(e) as being anticipated by Fukuyama et al. (US 6,831,406).

Regarding claims 21, 23, 53, Fukuyama discloses (see figure 6) an organic light emitting device comprising an anode (10), a cathode (18), a hole transporting layer (12) including a hole transport compound, an electron transporting layer (16) including an electron transport compound, a light emitting layer (14) including an organic light emitting compound, a first mixed region (28) including a mixture of the hole transport compound and the light emitting compound, and a second mixed region (26) including a mixture of the light emitting compound and the electron transport compound. (Column 7 line 62 – Column 8 line 12). The light emitting compound, electron transporting compound, and hole transporting compound, are all organic and unique.

Regarding claims 25-28, Fukuyama teaches the use of a light emitting compound in the light emitting layer that is the emitter for the organic light emitting device. Therefore the difference in energy between the highest occupied molecular orbital and the lowest unoccupied molecular orbital of the first compound is necessarily smaller than the difference the difference in energy between the highest occupied molecular orbital and the lowest unoccupied molecular orbital of the second and third compounds. Further Fukuyama discloses the use a light emitting compound in an organic polymer or host material. (Column 5 lines 41-60)

Regarding claims 39 and 40, Fukuyama discloses the use of an organic compound in the light emitting layer that emits light from a triplet excitation state. (Column 5 lines 41-57)

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Regarding claims 51 and 52, Fukuyama further discloses the use of optoelectronic devices including the organic light emitting elements described. (Column 1 lines 7-12)

Regarding claims 54-56, the electron injecting region is located on the interface of the electron transporting layer and the cathode while the hole injecting region is located on the interface of the hole transporting layer and the anode.

Regarding claims 57-60, Fukuyama further discloses the use of multiple light emitting materials in the light emitting layer. Here one of the light emitting compounds is the host material while the second is doped in the light emitting layer. (Column 5 lines 55-56)

Regarding claims 81-88, Fukuyama discloses the use of an organic compound in the light emitting layer that emits light from a triplet excitation state. (Column 5 lines 41-57)

Regarding claims 97-104, Fukuyama further discloses the use of optoelectronic devices including the organic light emitting elements described. (Column 1 lines 7-12)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5-12, 21-28, 31-34, 39, 40, 43-46, and 51-104 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al. (US 6,558,817) in view of So et al. (US 5,925,980)

Regarding claims 5-12, 21-28, 43-46, 51, 52, 53-56, 89-92, and 97-100, Ueda discloses (see figure 3) an organic light emitting device comprising an anode (1), a cathode (5), a hole

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transporting layer (8) including a hole transport compound, a hole injection layer (7) including a hole injecting compound, an electron injection layer (4) including a electron injecting compound, an electron transporting layer (6) including a electron transport compound, and a light emitting layer (3) including an organic light emitting compound. (Column 19 line 24-58). The light emitting compound, electron transporting compound, electron injecting compound, a hole injecting compound, and hole transporting compound, are all organic and unique. However Ueda does not appear to exemplify the use of a mixed region between the organic layers, where the concentration of the first and second organic compounds changes continuously in the mixed region. So, in the analogous art of organic electroluminescent devices with graded regions, discloses (see abstract) the inclusion of a graduated region between a first organic region and a second organic region that changes continuously in the mixed region between the two layers. So further discloses (column 4 lines 13-25) because of continuous change from the first organic region to the second organic region the two materials are intermixed and disseminated so that no fixed interface is formed and adhesion problem of the two layers is resolved. The mixed region appears as a single layer of material which cannot separate and generally allows a smooth movement of carriers there across. This results in an improved organic electroluminescent device with improved reliability and operation (column 1 lines 60-65). Thus it would have been obvious to one of ordinary skill in the art at the time of invention to modify the device of Ueda to include the continuous regions as taught by So for resolving the problem of adhesion of two organic layers, smooth movement of carriers across the mixed region and to improve reliability and operation.

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Regarding claims 31-34, 39, 40, and 81-84, Fukuyama discloses the use of an organic compound in the light emitting layer that emits light from a triplet excitation state. (Column 5 lines 41-57)

Regarding claims 61-80, Fukuyama further discloses the use of a hole injecting layer of copper phthalocyanine and an electron injection layer formed of a conjugate system organic compound doped with a Lewis Base. (Column 18 lines 30-65) and (Column 21 lines 55-57)

Regarding claims 57-60, 85-88, 93-96, and 101-104, Fukuyama discloses the use of an organic compound in the light emitting layer that acts as a host material and is doped with a light emitting compound. (Column 21 lines 30-36)

Response to Arguments

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Regarding the standing objection to change the title, the examiner realizes that the title was previously amended, however it is the view of the examiner that no further clarity was gained by the amendment. The examiner has proposed a suggestion to alleviate the standing objection, however this is only one example and is not to be considered limiting. Otherwise the applicant is encouraged to respond directly as to why the title should not be further amended so a proper response can be made to those points.

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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matt P Hodges whose telephone number is (571) 272-2454. The examiner can normally be reached on 7:30 AM to 4:00 PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mph



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